US009956328B2

(12) **United States Patent**
Long et al.

(10) **Patent No.: US 9,956,328 B2**
(45) **Date of Patent: *May 1, 2018**

(54) **MULTI-CONDUIT CONNECTORS AND METHODS FOR NEGATIVE PRESSURE WOUND THERAPY**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 394 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/930,479**

(22) Filed: **Nov. 2, 2015**

(65) **Prior Publication Data**

US 2016/0114089 A1 Apr. 28, 2016

Related U.S. Application Data

(63) Continuation of application No. 13/874,974, filed on May 1, 2013, now Pat. No. 9,205,246, which is a (Continued)

(51) **Int. Cl.**
A61M 1/00 (2006.01)
B23P 17/04 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***A61M 1/0086*** (2014.02); ***A61M 1/00*** (2013.01); ***A61M 3/0279*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC A61M 1/00; A61M 1/0086; A61M 35/00; A61M 39/105; A61M 39/20; A61M 3/0279; Y10T 137/87571; Y10T 137/8759
See application file for complete search history.

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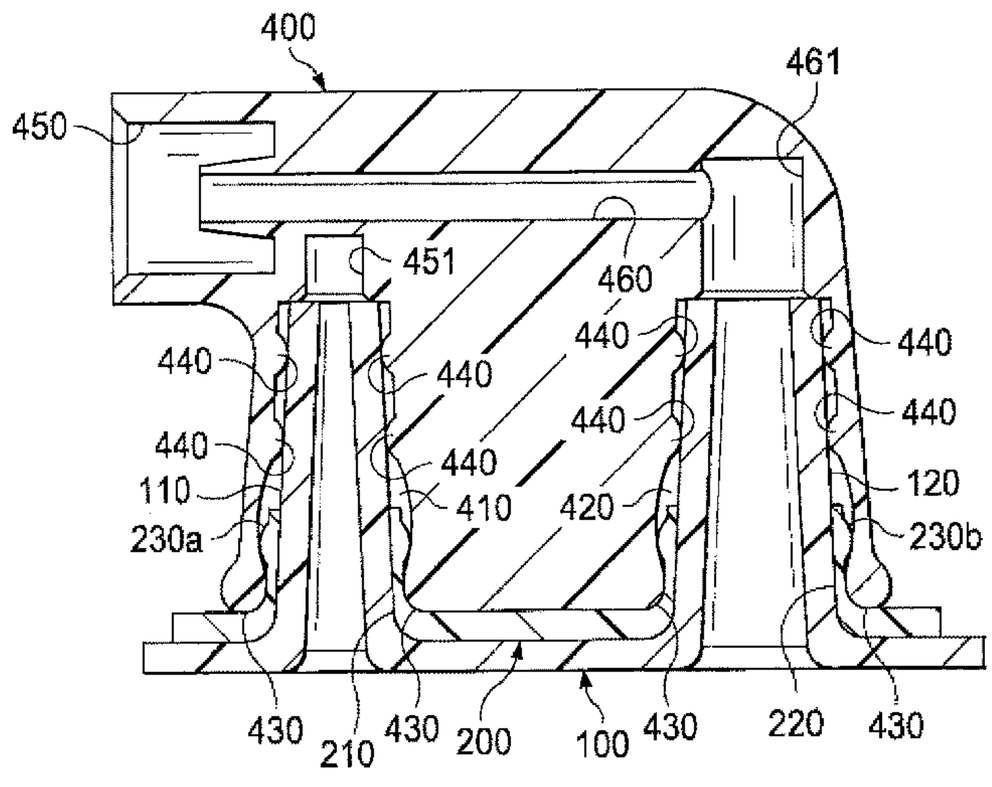
(57) **ABSTRACT**

Multi-conduit connector apparatuses for use in negative pressure wound therapy (NPWT) apparatuses to wound dressing, and methods for installing multi-conduit connector apparatuses in NPWT apparatuses.

22 Claims, 4 Drawing Sheets



Related U.S. Application Data

continuation of application No. 13/017,857, filed on Jan. 31, 2011, now Pat. No. 8,454,567.

(60) Provisional application No. 61/300,362, filed on Feb. 1, 2010.

(51) **Int. Cl.**

A61M 39/10	(2006.01)
A61M 3/02	(2006.01)
A61M 35/00	(2006.01)
A61M 39/20	(2006.01)

(52) **U.S. Cl.**

CPC ***A61M 35/00*** (2013.01); ***A61M 39/105*** (2013.01); ***A61M 39/20*** (2013.01); ***B23P 17/04*** (2013.01); *Y10T 29/49826* (2015.01); *Y10T 137/87571* (2015.04); *Y10T 137/87579* (2015.04); *Y10T 137/87587* (2015.04); *Y10T 137/87668* (2015.04); *Y10T 137/87676* (2015.04); *Y10T 137/87684* (2015.04); *Y10T 137/87692* (2015.04)

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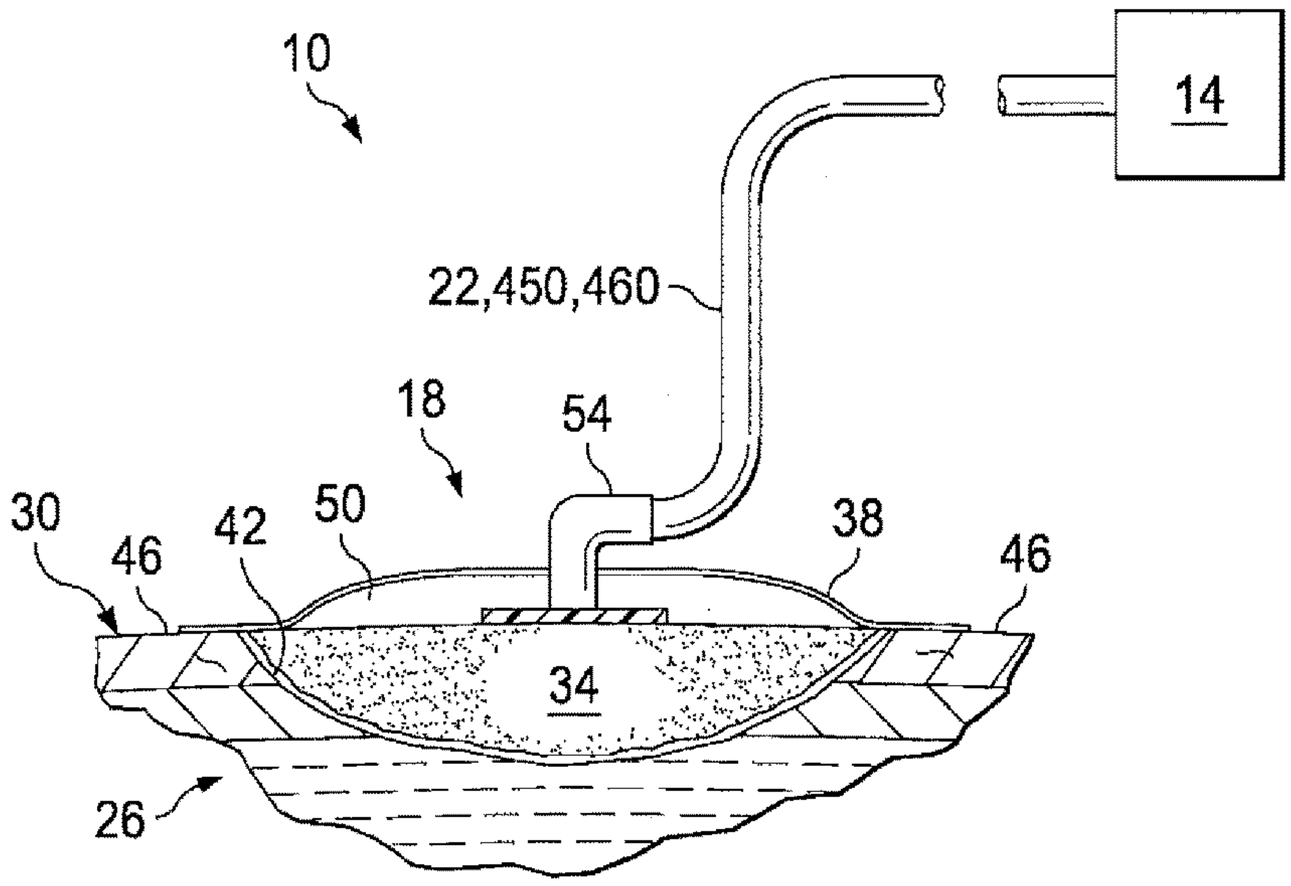

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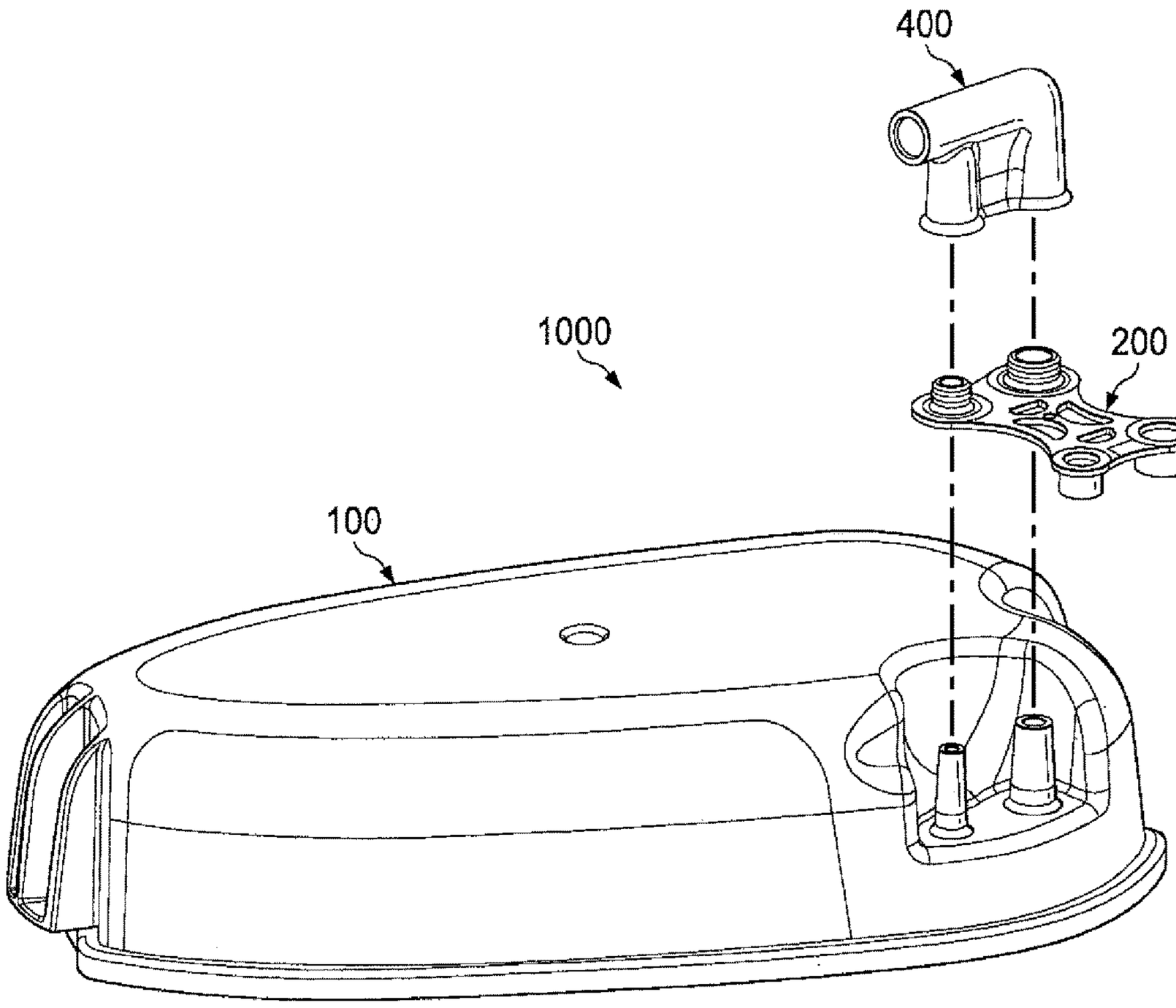

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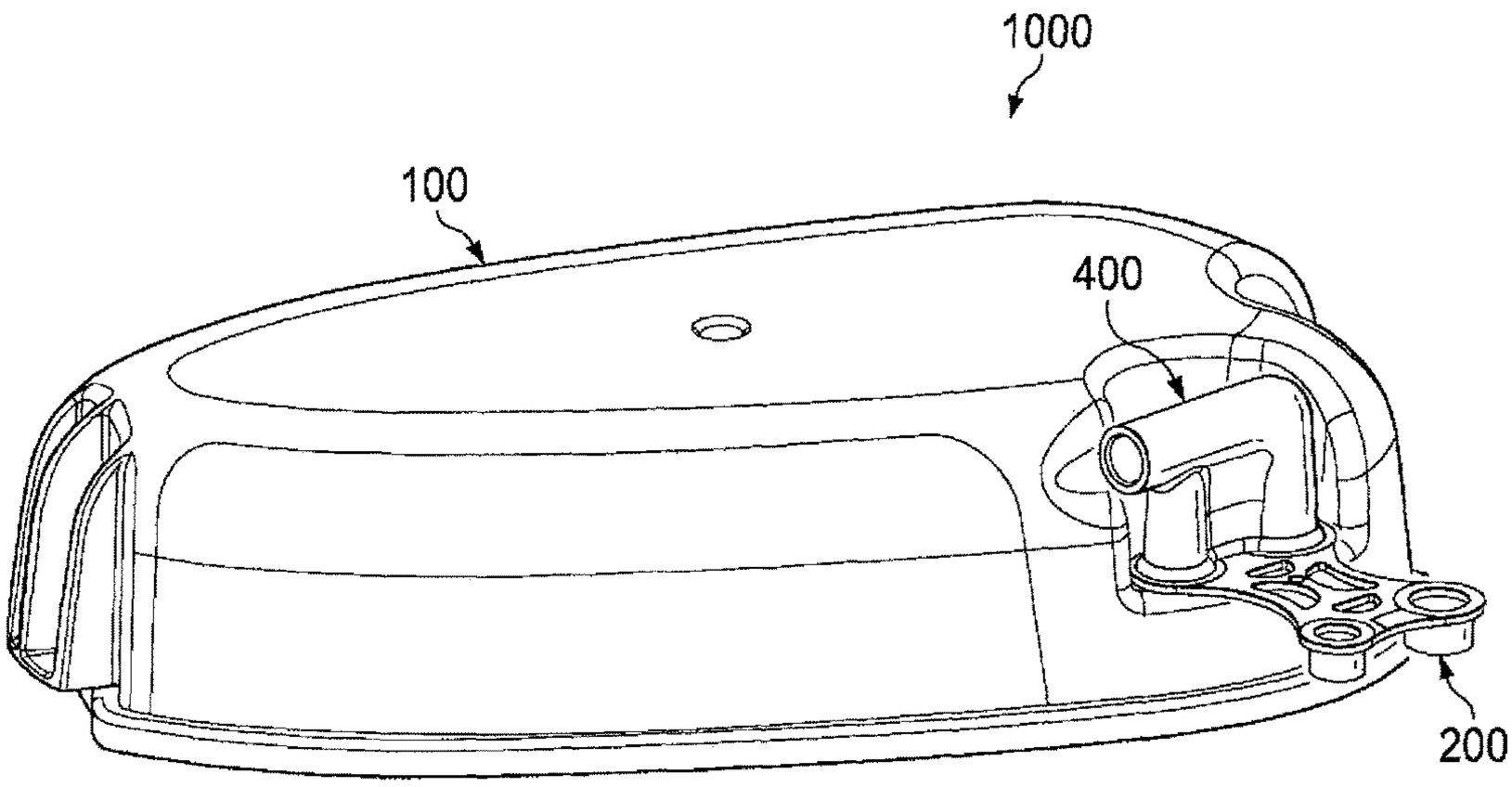

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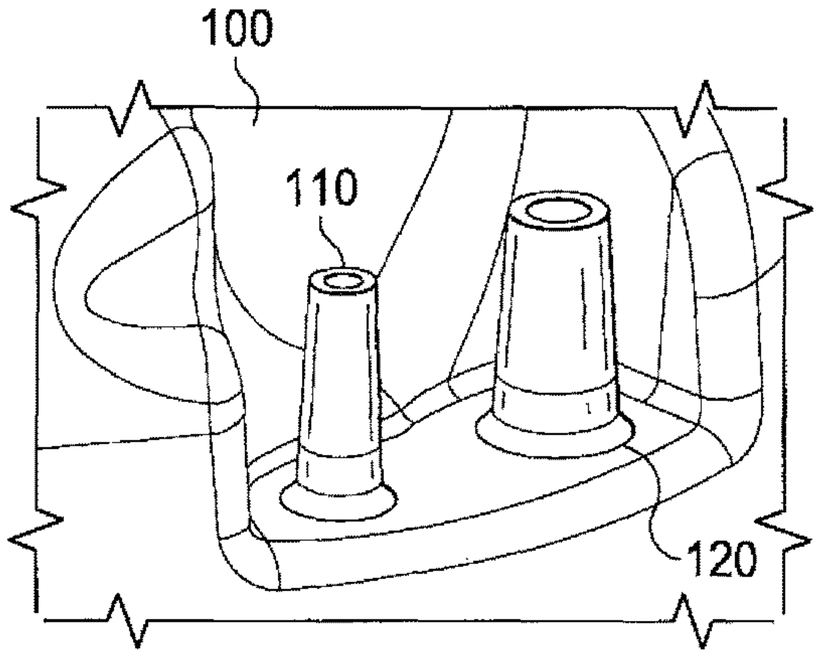

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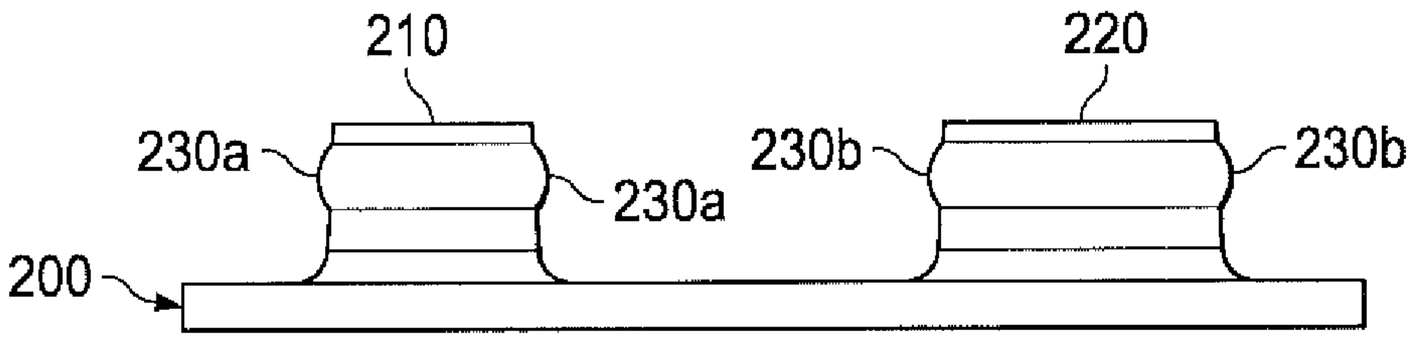
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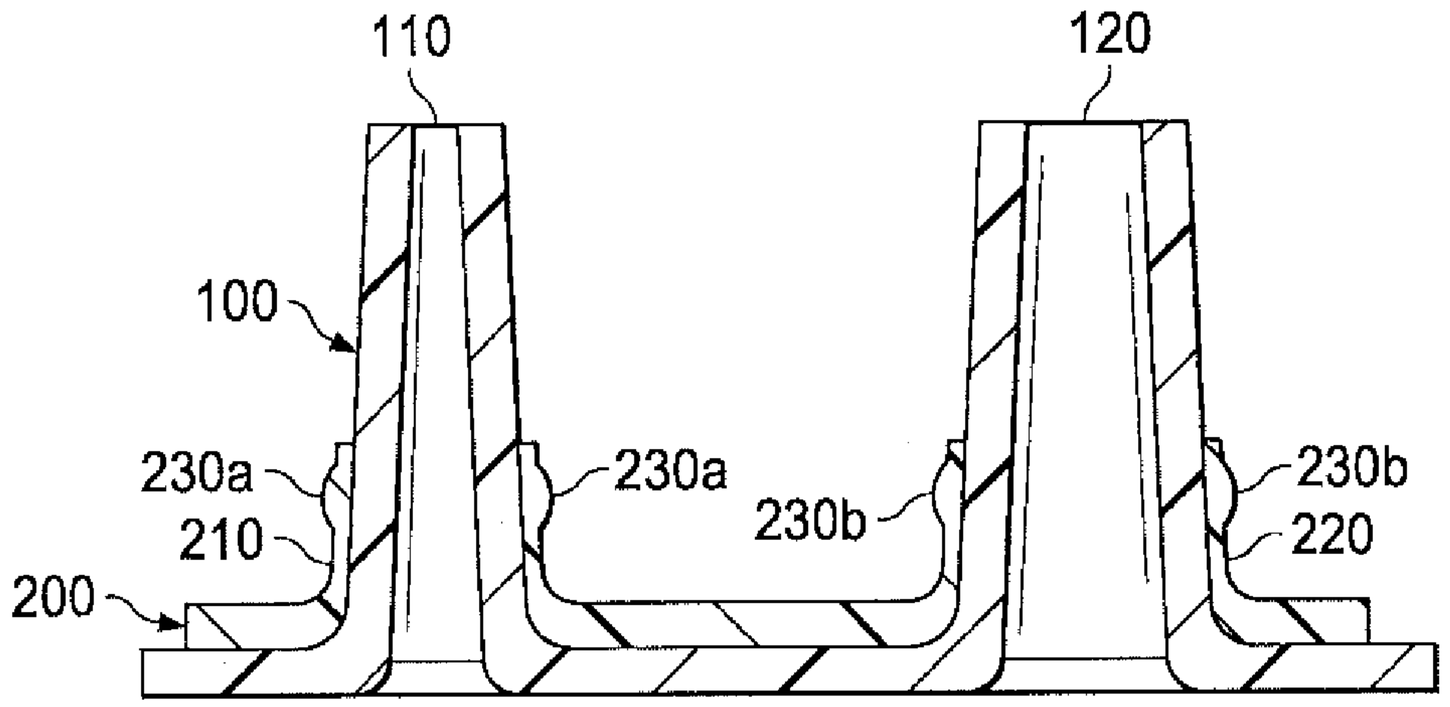
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FIG. 6

FIG. 7

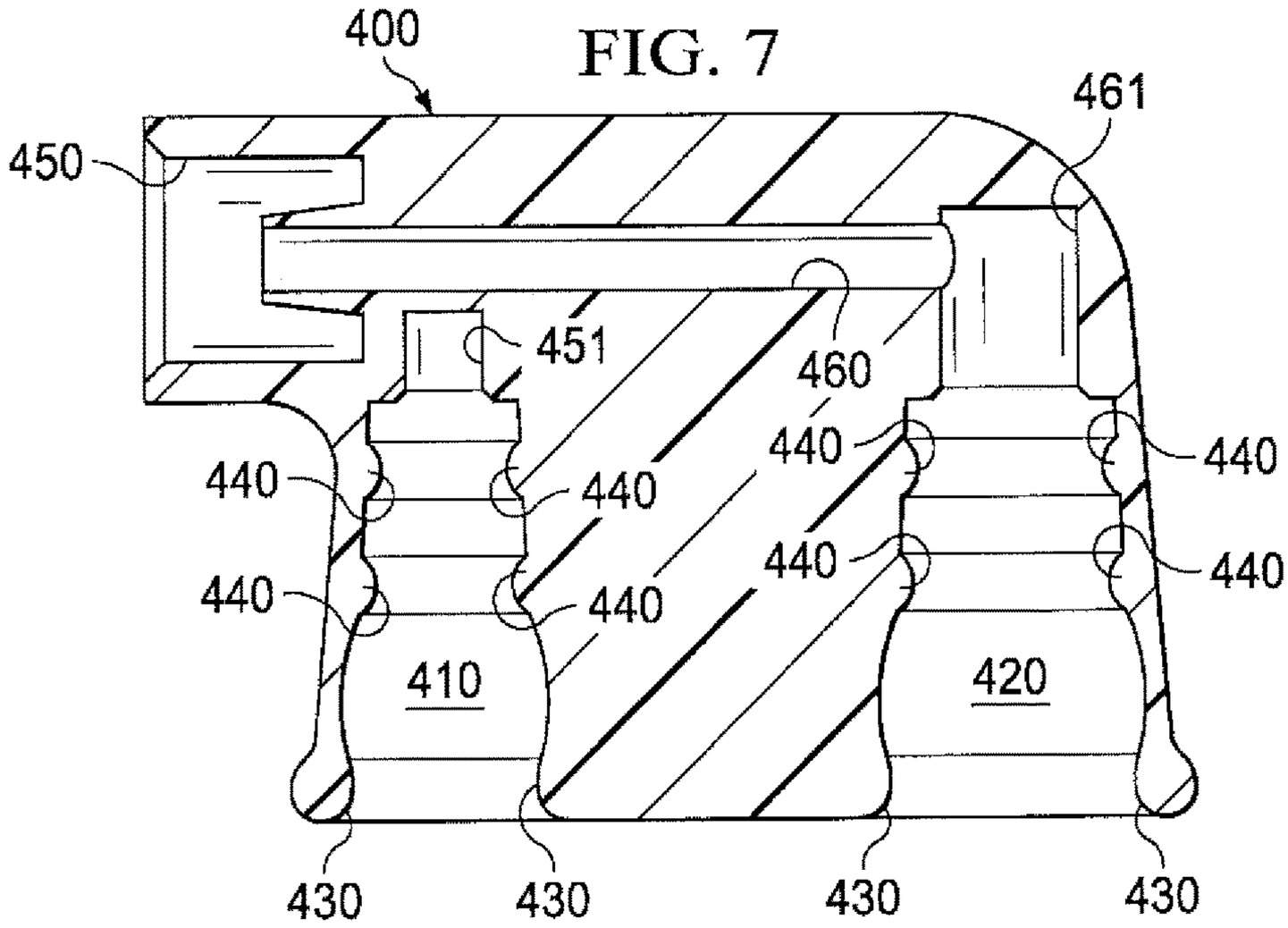
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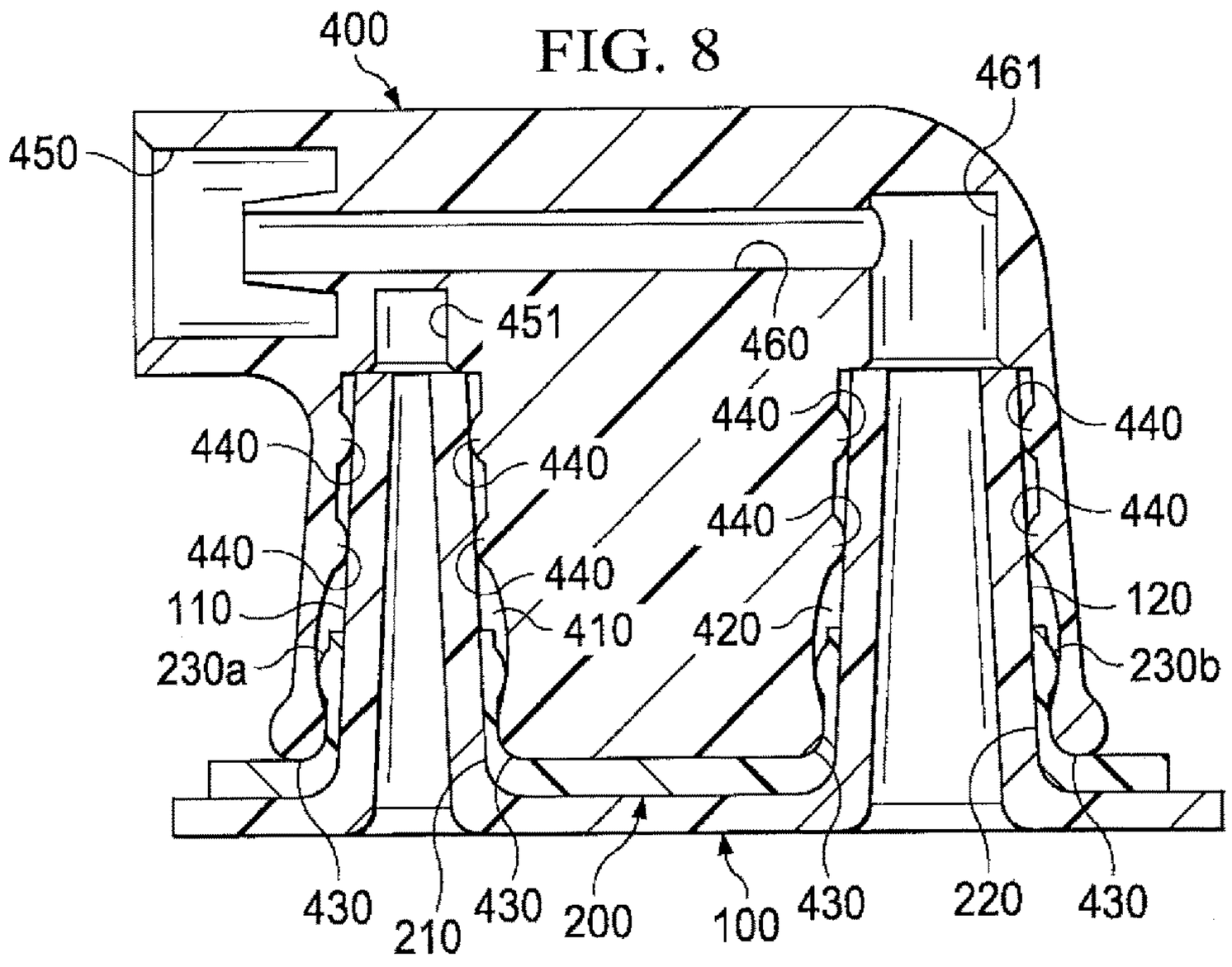
FIG. 8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MULTI-CONDUIT CONNECTORS AND METHODS FOR NEGATIVE PRESSURE WOUND THERAPY

CROSS-REFERENCE(S) TO RELATED APPLICATION(S)

This application is a continuation of U.S. patent application Ser. No. 13/874,974, filed May 1, 2013, which is a continuation of U.S. patent application Ser. No. 13/017,857, filed Jan. 31, 2011, now U.S. Pat. No. 8,454,567, which claims priority to U.S. Provisional Patent Application Ser. No. 61/300,362 filed Feb. 1, 2010. This provisional application is expressly incorporated by reference.

BACKGROUND

1. Field of the Invention

The present invention relates generally to healing of wounds and wound-treatment therapies. More particularly, but not by way of limitation, the present invention relates to apparatuses and methods for a multi-conduit connector used in negative pressure wound therapy (NPWT) apparatuses and methods.

2. Background Information

Clinical studies and practice have shown that providing a reduced pressure in proximity to a tissue site augments and accelerates the growth of new tissue at the tissue site. The applications of this phenomenon are numerous, but application of reduced pressure has been particularly successful in treating wounds. This treatment (frequently referred to in the medical community as "negative pressure wound therapy," "reduced pressure therapy," or "vacuum therapy") provides a number of benefits, including faster healing and increased formulation of granulation tissue. Typically, reduced pressure is applied to tissue through a wound insert (e.g., a porous pad or other manifold device).

While NPWT has been highly successful in the promotion of wound closure, healing many wounds previously thought largely untreatable, some difficulty remains. One common component of an NPWT system is a device or structure (e.g., a multi-conduit connector) that connects a canister housing a vacuum, a fluid receptacle, or both to a medical tubeset. The tubeset may be used to deliver negative pressure to the wound site, to remove exudates from the wound site, or both.

While NPWT has been used for some time, multi-conduit connectors can be expensive to manufacture and difficult to install. Often, a user is unable to determine whether a connection has been made between the multi-conduit connector and the canister.

SUMMARY

The present disclosure includes embodiments of multi-conduit connectors. Specific embodiments comprise multi-conduit connector apparatuses for use in negative pressure wound therapy (NPWT) apparatuses and methods for installing multi-conduit connector apparatuses in NPWT apparatuses.

Specific embodiments include a multi-conduit connector apparatus comprising a canister lid comprising a first nipple and a second nipple; a cap sleeve, comprising a first annular sleeve and a second annular sleeve, where the first annular sleeve engages the first nipple and the second annular sleeve engages the second nipple; and a housing, comprising a first port, comprising a plurality of sealing ridges, the plurality of sealing ridges creating a seal with the first nipple; a second port, comprising a plurality of sealing ridges, the plurality of sealing ridges creating a seal with the second nipple; a first conduit comprising a first outlet, where the first outlet is in fluid communication with the first nipple; and a second conduit comprising a second outlet, where the second outlet is in fluid communication with the second nipple.

In certain embodiments, the first conduit is coupled to the first port. The second conduit may be coupled to the second port. The first conduit, the second conduit, or both may be coupled to a wound dressing. The first conduit and/or the second conduit may be comprised of a single lumen or multiple lumens.

Other embodiments may comprise a multi-conduit connector apparatus comprising: a canister lid comprising a first nipple and a second nipple; a cap sleeve, comprising: a first annular sleeve comprising a first clearance shoulder, where the first annular sleeve engages the first nipple; and a second annular sleeve comprising a second clearance shoulder, where the second annular sleeve engages the second nipple; and a housing, comprising: a first port, comprising: a plurality of sealing ridges, the plurality of sealing ridges creating a seal with the first nipple; and a first engagement tab, the first engagement tab engaging the first clearance shoulder; a second port, comprising: a plurality of sealing ridges, the plurality of sealing ridges creating a seal with the second nipple; and a second engagement tab, the second engagement tab engaging the second clearance shoulder; a first conduit comprising a first outlet, where the first outlet is in fluid communication with the first nipple; and a second conduit comprising a second outlet, where the second outlet is in fluid communication with the second nipple.

In certain embodiments, the first outlet is coupled to the first nipple. In other embodiments, the second outlet is coupled to the second nipple. In specific embodiments, the first conduit or the second conduit may be coupled to a wound site. In some embodiments, the first nipple or the second nipple may be a tapered nipple.

In some embodiments, the cap sleeve may further comprises a sleeve lid and/or a hinge. The cap sleeve lid may be comprised of plastic or rubber in certain embodiments.

In certain embodiments, the clearance shoulder is substantially a ring. In other embodiments, the clearance shoulder is deformable.

Still other embodiments comprise a multi-conduit connector apparatus comprising: a canister lid comprising a first nipple and a second nipple, where the first nipple further comprises a first clearance shoulder, and the second nipple further comprises a second clearance shoulder; and a housing, comprising: a first port, comprising: a plurality of sealing ridges, the plurality of sealing ridges creating a seal with the first nipple; and a first engagement tab, the first engagement tab engaging the first clearance shoulder; a second port, comprising: a plurality of sealing ridges, the plurality of sealing ridges creating a seal with the second nipple; and a second engagement tab, the second engagement tab engaging the second clearance shoulder; a first conduit comprising: a first outlet, where the first outlet is coupled to the first nipple, and where the multi-lumen coupling member is configured to be coupled to a wound site; and a second conduit comprising: a second outlet, where the second outlet is coupled to the second nipple, and where the second conduit member is configured to be coupled to a wound site.

Other embodiments may comprise obtaining a multi-conduit connector apparatus comprising: a canister lid comprising a first nipple and a second nipple; a cap sleeve,

comprising: a first annular sleeve comprising a first clearance shoulder, where the first annular sleeve engages the first nipple; and a second annular sleeve comprising a second clearance shoulder, where the second annular sleeve engages the second nipple; and a housing, comprising: a first port, comprising: a plurality of sealing ridges, the plurality of sealing ridges creating a seal with the first nipple; and a first engagement tab, the first engagement tab engaging the first clearance shoulder, a second port, comprising: a plurality of sealing ridges, the plurality of sealing ridges creating a seal with the second nipple; and a second engagement tab, the second engagement tab engaging the second clearance shoulder, a first conduit comprising a first outlet, where the first outlet is in fluid communication with the first nipple; and a second conduit comprising a second outlet, where the second outlet is in fluid communication with the second nipple; placing the cap sleeve on the canister lid; placing the housing on the cap sleeve and canister lid; and applying a downward force until the housing has fully engaged the canister lid. Still other embodiments comprise placing the housing on the cap sleeve and the canister lid and applying a downward force to the housing until the housing has fully engaged the canister lid.

Yet other embodiments comprise a method for sealing a multi conduit connector, comprising: obtaining a multi-conduit connector apparatus comprising: a canister lid comprising a first nipple and a second nipple, where the first nipple further comprises a first clearance shoulder, and the second nipple further comprises a second clearance shoulder; and a housing, comprising: a first port, comprising: a plurality of sealing ridges, the plurality of sealing ridges creating a seal with the first nipple; and a first engagement tab, the first engagement tab engaging the first clearance shoulder; a second port, comprising: a plurality of sealing ridges, the plurality of sealing ridges creating a seal with the second nipple; and a second engagement tab, the second engagement tab engaging the second clearance shoulder; a first conduit comprising: a first outlet, where the first outlet is coupled to the first nipple, and where the multi-lumen coupling member is configured to be coupled to a wound site; and a second conduit comprising: a second outlet, where the second outlet is coupled to the second nipple, and where the second conduit member is configured to be coupled to a wound site; placing the housing of on the canister lid; and applying a downward force until the housing has fully engaged the canister lid.

Any embodiment of any of the present systems and/or methods can consist of or consist essentially of—rather than comprise/include/contain/have—any of the described steps, elements, and/or features. Thus, in any of the claims, the term "consisting of or "consisting essentially of can be substituted for any of the open-ended linking verbs recited above, in order to change the scope of a given claim from what it would otherwise be using the open-ended linking verb. Details associated with the embodiments described above and others are presented below.

BRIEF DESCRIPTION OF THE DRAWINGS

The following drawings illustrate by way of example and not limitation. For the sake of brevity and clarity, every feature of a given structure is not always labeled in every figure in which that structure appears, and structural features may be drawn larger or smaller than scale. Identical reference numbers do not necessarily indicate an identical structure. Rather, the same reference number may be used to indicate a similar feature or a feature with similar functionality, as may non-identical reference numbers.

FIG. **1** depicts a schematic view of a wound treatment system.

FIG. **2** depicts an exploded view of one embodiment of the present multi-conduit connector, canister lid, cap sleeve, and multi-conduit housing.

FIG. **3** depicts an assembly view of the multi-conduit connector, canister lid, cap sleeve, and multi-conduit housing.

FIG. **4** depicts a perspective view of a portion of the canister lid of FIGS. **2** and **3**.

FIG. **5** depicts a side view of one embodiment of the present cap sleeve.

FIG. **6** depicts a side cross-sectional view of the cap sleeve of FIG. **5** coupled to the portion of the canister lid of FIG. **4**.

FIG. **7** depicts a cross-sectional view of one embodiment of the multi-conduit housing.

FIG. **8** depicts a cross-sectional assembly view of the canister lid of FIG. **3**, the cap sleeve of FIG. **4** and the multi-conduit housing of FIG. **6**.

DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

The term "coupled" is defined as connected, although not necessarily directly, and not necessarily mechanically; two items that are "coupled" may be integral with each other. The terms "a" and "an" are defined as one or more unless this disclosure explicitly requires otherwise. The terms "substantially," "approximately," and "about" are defined as largely but not necessarily wholly what is specified, as understood by a person of ordinary skill in the art.

The terms "comprise" (and any form of comprise, such as "comprises" and "comprising"), "have" (and any form of have, such as "has" and "having"), "include" (and any form of include, such as "includes" and "including") and "contain" (and any form of contain, such as "contains" and "containing") are open-ended linking verbs. As a result, a method that "comprises," "has," "includes" or "contains" one or more steps possesses those one or more steps, but is not limited to possessing only those one or more steps. Likewise, a connector that "comprises," "has," "includes" or "contains" one or more elements possesses those one or more elements, but is not limited to possessing only those elements. For example, in a connector that comprises a nipple and a port, the connector includes the specified elements but is not limited to having only those elements. For example, such a connector could also include an annular sleeve.

Further, a device or structure that is configured in a certain way is configured in at least that way, but it can also be configured in other ways than those specifically described.

Embodiments of the multi-conduit connector apparatus depicted may be used in a variety of applications. A non-limiting example of a use for a multi-conduit connector apparatus is in the field of negative pressure wound therapy (NPWT). The connector apparatus can link more than one conduit to a wound dressing and a wound treatment apparatus.

FIG. **1** shows an embodiment of a wound treatment system **10**. In the embodiment shown, apparatus **10** comprises a wound-treatment apparatus **14**, and a wound dressing **18** coupled to apparatus **14** by a conduit **22**. In the embodiment shown, conduit **22** further comprises a conduit **450** and a conduit **460**. As shown, dressing **18** is configured

to be coupled to (and is shown coupled to) a wound **26** of a patient **30**. More particularly, in the embodiment shown, dressing **18** comprises a wound insert **34** and a drape **38**. As shown, wound insert **34** is configured to be positioned (and is shown positioned) on wound **26** (e.g., on or adjacent to wound surface **42**), and/or drape **38** is configured to be coupled to (and is shown coupled to) skin **46** of the patient adjacent to wound **26** such that drape **38** covers wound insert **34** and wound **26**, and forms a space **50** between drape **38** and wound **26** (e.g., wound surface **42**).

Apparatus **14** can comprise, for example, a vacuum source configured to be actuatable (and/or actuated) to apply negative pressure (e.g., via conduit **22**) to wound dressing **18**, a fluid source configured to be actuatable (and/or actuated) to deliver (e.g., via conduit **22**) a fluid (for example, an instillation fluid such as a medicinal fluid, antibacterial fluid, or an irrigation fluid) to wound dressing **18**. Wound treatment apparatus **14** may further comprise multi-conduit connector apparatus **1000** depicted in FIG. **2** and FIG. **3**. System **10** can be implemented and/or actuated and/or coupled to patient **30** in any of various configurations and/or methods similar to those described in the prior art. For example, various wound therapy systems and components are commercially available through and/or from KCI USA, Inc. of San Antonio, Tex., U.S.A., and/or its subsidiary and related companies (collectively, "KCI").

Conduits **22**, **450**, **460** can comprise a single lumen conduit (e.g., switched between a vacuum source and/or a fluid source and apparatus **14**), or can comprise multiple single-lumen conduits or a multi-lumen conduit such that, for example, fluid can be delivered and/or negative pressure can be applied to wound dressing **18** individually and/or simultaneously. Additionally, conduits **22**, **450**, **460** can comprise, for example, multiple lumens (e.g., as in a single conduit with a central limit for application of negative pressure and/or fluid delivery and one or more peripheral lumens disposed adjacent or around the central lumen such that the peripheral lumens can be coupled to a pressure sensor to sense and/or detect a pressure or negative pressure between drape **38** and surface **42** (e.g. in space **50**), as described in the Hunt and Boynton patents incorporated above.

In the embodiment shown, system **10** further comprises a wound dressing connection pad **54** configured to be coupled (and shown coupled) to conduit **22**. One example of a suitable connection pad **54** is the "V.A.C. T.R.A.C.® Pad," commercially available from KCI. One example of a suitable drape **38** includes the "V.A.C.® Drape" commercially available from KCI.

Turning now to FIG. **2** and FIG. **3**, one example of a multi-conduit connector apparatus **1000** is shown that comprises embodiments of a canister lid **100**, a cap sleeve **200**, and a multi-conduit housing **400** is shown. FIG. **2** shows an exploded view, while FIG. **3** shows an assembly view in which canister lid **100**, cap sleeve **200**, and multi-conduit housing **400** are coupled together. In the embodiment shown, cap sleeve **200** is placed over nipples **110**, **120** on canister lid **100**. Multi conduit housing **400** is placed over canister lid **100** and cap sleeve **200**.

In some embodiments, canister lid **100**, cap sleeve **200**, and/or multi-conduit housing **400** may be comprised of rubber or plastic. In some embodiments, canister lid **100**, cap sleeve **200**, and multi-conduit housing **400** may be designed for a single use.

Referring now to FIG. **4**, an example of a canister lid **100** is shown. Other features of a canister lid not relating to the embodiments of the invention disclosed are not pictured for the sake of clarity. Canister lid **100** comprises first nipple **110** and second nipple **120**. First nipple **110** may be configured to be coupled to a first outlet **451** shown in FIG. **7**. Second nipple **120** may be configured to be coupled to a second outlet **461** shown in FIG. **7**.

In some embodiments, first nipple **110** is configured to be coupled to a vacuum pump, a pressure sensor, or both. In some embodiments, second nipple **120** is configured to be coupled to an exudate receptacle. In other embodiments second nipple **120** is configured to be coupled to a source of medicaments.

Referring now to FIG. **5**, an example of a cap sleeve **200** is shown. Cap sleeve **200** comprises a first annular sleeve **210** and a second annular sleeve **220**. First annular sleeve **210** and second annular sleeve **220** comprises a first clearance shoulder **230***a* on the outer surface of the sleeve. Second annular sleeve **220** comprises a second clearance shoulder **230***b* on the outer surface of the sleeve. Some embodiments of cap sleeve **200** may comprise a hinge and a lid (not shown) for each annular sleeve **210**, **220** coupled to the hinge. Other embodiments may have a separate lid piece (not shown) for the annular sleeves **210**, **220**.

Referring now to FIG. **6**, a sectional assembly view of canister lid **100** of FIG. **4** and cap sleeve **200** of FIG. **5** is shown. Cap sleeve **200** is coupled to canister lid **100**. In some embodiments, cap sleeve **200** may be removably coupled to canister lid **100**. In other embodiments, cap sleeve **200** may be permanently affixed to canister lid **100**. First annular sleeve **210** engages first nipple **110**. Second annular sleeve **220** engages second nipple **120**. Annular sleeves **210**, **220** may be substantially in the shape of a circular ring in some embodiments. In other embodiments, annular sleeves **210**, **220** may be substantially in the shape of a triangular ring, a square ring, or any other ring shape.

Referring now to FIG. **7**, a sectional view of multi-conduit housing **400** is shown. Multi-conduit housing **400** comprises a first port **410** and a second port **420**. First port **410** is configured to engage first nipple **110**. Second port **420** is configured to engage second nipple **120**. First port **410** comprises engagement tab **430** and a plurality of sealing ridges **440**. Second port **420** comprises engagement tab **430** and a plurality of sealing ridges **440**. Engagement tabs **430** are configured to engage clearance shoulders **230***a*, **230***b*. Sealing ridges **440** are configured to engage first nipple **110** and second nipple **120**. In some embodiments, engagement tab **430** and sealing ridges **440** are made of a deformable material, including but not limited to rubber or plastic.

Ports **410**, **420** are structural elements of multi-conduit housing **400** that are configured to be coupled to nipples **110**, **120**. Ports **410**, **420** are substantially the inverse shape of the corresponding nipples **110**, **120**. For example, in some embodiments nipples **110**, **120** are substantially in the shape of a frustum. In these embodiments, corresponding ports **410**, **420** are also in the shape of a frustum. Nipples **110**, **120** and ports **410**, **420** may also be in the shape of cylinders, cones, prisms, or any other shape about which a seal can be created.

Multi-conduit housing **400** further comprises a first conduit **450** and a second conduit **460**. First conduit **450** is configured to be coupled to a wound site. Multi-conduit housing **400** further comprises a first outlet **451**. In some embodiments, first outlet **451** is configured to be coupled to first nipple **110**. First conduit **450** is in fluid communication with first outlet **451**.

Second conduit **460** is configured to be coupled to a wound site and further comprises a second outlet **461**. In some embodiments, second outlet **461** is configured to be

coupled to second nipple **120**. First conduit **450** and second conduit **460** may be coaxial or parallel. Second conduit **460** is in fluid communication with second outlet **461**.

Referring now to FIG. **8**, a sectional assembly view of canister lid **100**, cap sleeve **200**, and multi-conduit housing **400** of FIG. **3** is shown. Cap sleeve **200** is coupled to canister lid **100**. In some embodiments, cap sleeve **200** may be removably coupled to canister lid **100**. In other embodiments, cap sleeve **200** may be permanently affixed to canister lid **100**. First annular sleeve **210** engages first nipple **110**. Second annular sleeve **220** engages second nipple **120**.

Multi-conduit housing **400** engages both cap sleeve **200** and canister lid **100**. First port **410** engages first nipple **110**. First outlet **451** is in fluid communication with first nipple **110**. Second port **420** engages second nipple **120**. Second outlet **461** is in fluid communication with second nipple **120**.

Engagement tab **430** engages clearance shoulders **230***a*, **230***b*, creating a seal between first port **410** and first annular sleeve **210**, and also creating a seal between second port **420** and second annular sleeve **220**. Sealing ridges **440** engage first nipple **110**, creating a seal between first port **410** and first nipple **110**. Sealing ridges **440** also engage second nipple **120**, creating a seal between second port **420** and second nipple **120**.

Other embodiments of this disclosure comprise only canister lid **100** and multi-conduit housing **400**. First nipple **110** further comprises first clearance shoulder **230***a*. Second nipple **120** also further comprises second clearance shoulder **230***b*.

The arrangement in FIG. **8** provides a user with tactile and audible feedback that a connection has been made. In some embodiments, cap sleeve **200** is coupled to canister lid **100** during the manufacturing process. In other embodiments, cap sleeve **200** is installed by a user. In a hospital or clinical setting, a user may engage multi-conduit housing **400** with first nipple **110** and second nipple **120**. The user may apply a downward force to multi-conduit housing **400** until engagement tabs **430** passes clearance shoulders **230***a*, **230***b* and can move no further. In some embodiments, an audible sound may be heard once multi-conduit housing **400** is fully engaged.

The various illustrative embodiments of devices, systems, and methods described herein are not intended to be limited to the particular forms disclosed. Rather, they include all modifications and alternatives falling within the scope of the claims.

The claims are not intended to include, and should not be interpreted to include, means-plus- or step-plus-function limitations, unless such a limitation is explicitly recited in a given claim using the phrase(s) "means for" or "step for," respectively.

It will be understood that the benefits and advantages described above may relate to one embodiment or may relate to several embodiments. It will further be understood that reference to 'an' item refers to one or more of those items.

The steps of the methods described herein may be carried out in any suitable order, or simultaneously where appropriate.

Where appropriate, aspects of any of the examples described above may be combined with aspects of any of the other examples described to form further examples having comparable or different properties and addressing the same or different problems.

It will be understood that the above description of preferred embodiments is given by way of example only and that various modifications may be made by those skilled in the art. The above specification, examples and data provide a complete description of the structure and use of exemplary embodiments of the invention. Although various embodiments of the invention have been described above with a certain degree of particularity, or with reference to one or more individual embodiments, those skilled in the art could make numerous alterations to the disclosed embodiments without departing from the scope of this invention.

We claim:

1. A canister connector apparatus comprising:
- a lid having a first nipple and a second nipple;
- a cap sleeve having a first annular sleeve configured to engage the first nipple and a second annular sleeve configured to engage the second nipple; and
- a conduit housing configured to engage the lid and having a first port with a plurality of sealing ridges configured to create a seal with the first nipple when engaged with the first nipple and a second port with a plurality of sealing ridges configured to create a seal with the second nipple when engaged with the second nipple.

2. The apparatus of claim **1**, wherein a conduit is fluidly coupled to the first port and in fluid communication with the first nipple.

3. The apparatus of claim **2**, wherein the conduit is fluidly coupled to a wound dressing.

4. The apparatus of claim **2**, wherein the conduit comprises a single lumen.

5. The apparatus of claim **2**, wherein the conduit comprises multiple lumens.

6. The apparatus of claim **1**, wherein a conduit is fluidly coupled to the second port and in fluid communication with the second nipple.

7. The apparatus of claim **6**, wherein the conduit is fluidly coupled to a wound dressing.

8. The apparatus of claim **6**, wherein the conduit comprises a single lumen.

9. The apparatus of claim **6**, wherein the conduit comprises multiple lumens.

10. The apparatus of claim **1**, wherein:
- a first conduit is fluidly coupled to the first port and in fluid communication with the first nipple; and
- a second conduit is fluidly coupled to the second port and in fluid communication with the second nipple.

11. A system for treating a wound comprising:
- a wound dressing;
- a first conduit and a second conduit each having a first end configured to be fluidly coupled to the wound dressing and a second end; and
- an apparatus for treating the wound including a canister apparatus comprising:
  - a lid having a first nipple and a second nipple;
  - a cap sleeve having a first annular sleeve configured to engage the first nipple and a second annular sleeve configured to engage the second nipple; and
  - a conduit housing configured to engage the cap sleeve and having a first port configured to be fluidly coupled to the second end of the first conduit and having a plurality of sealing ridges configured to create a seal with the first nipple when engaged with the first nipple, and a second port configured to be fluidly coupled to the second end of the second conduit and having a plurality of sealing ridges configured to create a seal with the second nipple when engaged with the second nipple.

12. The system of claim **11**, wherein the apparatus further comprises a vacuum source configured to be fluidly coupled to the first nipple.

13. The system of claim 11, wherein the apparatus further comprises a fluid source configured to be fluidly coupled to the second nipple.

14. The system of claim 11, wherein the first annular sleeve includes a first clearance shoulder and the second annular sleeve includes a second clearance shoulder, each configured to engage the cap sleeve when the conduit housing engages the cap sleeve.

15. The system of claim 11, wherein the first port includes a first engagement tab and the second port includes a second engagement tap, each configured to engage the conduit housing when the conduit housing engages the cap sleeve.

16. The system of claim 11, wherein:

the first annular sleeve includes a first clearance shoulder configured to engage a first engagement tab of the first port when the conduit housing engages the cap sleeve; and

the second annular sleeve includes a second clearance shoulder configured to engage a second engagement tab of the second port when the conduit housing engages the cap sleeve.

17. A method for treating a wound comprising:

coupling a wound dressing to a wound;

fluidly coupling a first end of a first conduit and a first end of a second conduit to the wound dressing;

providing an apparatus including a canister apparatus having:

a lid having a first nipple and a second nipple;

a cap sleeve having a first annular sleeve and a second annular sleeve; and

a conduit housing having a first port and a second port, each having a plurality of sealing ridges;

engaging the first annular sleeve with the first nipple and the second annular sleeve with the second nipple;

fluidly coupling the first port with the first nipple and the second port with the second nipple;

fluidly coupling a second end of the first conduit with the first port and a second end of the second conduit with the second port; and

treating the wound with the apparatus.

18. The method of claim 17, wherein fluidly coupling the first port with the first nipple and the second port with the second nipple comprises:

inserting the first nipple into the first port so that the plurality of sealing ridges engage the first nipple and the second nipple into the second port so that the plurality of sealing ridges engage the second nipple; and

engaging a first clearance shoulder of the first sleeve with a first engagement tab of the first port and a second clearance shoulder of the second sleeve with a second engagement tab of the second port to secure the conduit housing to the lid.

19. The method of claim 17, wherein the apparatus further comprises a vacuum source, and treating the wound with the apparatus further comprises fluidly coupling the vacuum source to the first nipple to supply reduced pressure to the wound.

20. The method of claim 17, wherein the apparatus further comprises a source of fluid, and treating the wound with the apparatus further comprises fluidly coupling the source of fluid to the second nipple to supply fluid to the wound.

21. The method of claim 20, wherein the fluid comprises at least one of medicinal fluid, antibacterial fluid, or irrigation fluid.

22. The method of claim 17, wherein the apparatus further comprises a vacuum source, and a fluid source and treating the wound with the apparatus further comprises fluidly coupling the vacuum source to the first nipple to supply reduced pressure to the wound and fluidly coupling the source of fluid to the second nipple to supply fluid to the wound.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,956,328 B2
APPLICATION NO. : 14/930479
DATED : May 1, 2018
INVENTOR(S) : Justin Alexander Long et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Claims

At Column 9, Claim number 15, Line number 11, replace “tap” with “tab”

Signed and Sealed this
Fourth Day of December, 2018

Andrei Iancu
Director of the United States Patent and Trademark Office